

REMARKS

Applicant requests reconsideration of the rejection of the claims.

Background Information

The invention concerns an improved structural panel for driving into soils, and connecting the panels together in edge-to-edge relationship as they are being driven, for the purpose of forming barrier walls, retaining walls, docks, etc.

One of the problems concerning panels of this type is the ability of the panels to withstand the driving forces applied to them when being installed in the soil, and then withstanding the effects of the environment. It is desirable to have the structural panels be as strong as possible, yet the expense and weight of the panels is desirably minimized. As a result of these desirable features, structural panels used for this purpose typically are formed in cross-sectional shapes that impart resistance to the bending of the panels, such as V-shapes, Z-shapes, U-shapes, etc. While these non-planar shapes tend to strengthen the panels for resistance against bending, etc., the non-planar shapes generally are undesirable. For example, it is standard practice to use horizontally extending wales that are mounted in supportive relationship against the structural panels and the wales make only "point-to-point" contact with the irregular shapes of the panels. This type of contact concentrates the forces and abrasions encountered between the wales and the panels, resulting in deterioration of the panels. Also, flat external surfaces of the panels are generally desirable for water craft that might engage the panels.

The prior art has not successfully provided structural panels that have flat outside surfaces that face the environment and that are of sufficient strength to resist bending, buckling, etc. while being formed of relatively thin material.

This invention comprises an improvement that is addressed to these problems.

Figs. 3 and 4 of the application gives a close-up view of the configuration of a panel that provides a substantially flat outer surface 20A and 20B, with a central wall section 22 and side wall sections 21 and 23 aligned with the central wall section, forming a flat outside surface. It will be noted that the locking elements 27 and 28 are recessed away from the outside flat surface of the wall so that the locking elements do not extend beyond the outer surface of the wall structure. This arrangement is highly beneficial as it permits substantially flat surface-to-surface contact with the surfaces of the panels, thereby spreading the forces and the results of abrasion over larger surfaces of the panels, thereby reducing the rate of deterioration of the panels. Further, the wales and other structures mounted against the structural wall will not engage the locking elements 27 and 28, thereby avoiding deterioration because of contact with wales, etc.

In order to provide the above described flat structure and its functional benefits, applicant has incorporated the strengthening flanges 30 and 32 that extend rearwardly from the central wall section 22. The central wall section 22 provides the desirable strength attributes for the wall structure.

Additional strengthening features include internal strengthening member 50 (Figs. 2 and 3) that extends in the U-shaped configuration of the central wall section 22 and the parallel strengthening flanges 30 and 32. The strengthening member 50 is formed of sheet material, preferably from steel or other metals, expanded metals, or fiberglass. The material of the panel is extruded about the strengthening sheet. This significantly adds to the overall strength of the structural panel, providing the ability of the panel to be formed with the flat outer wall surface,

yet allowing the panel to have such significant strength that it functions without the requirement of bends, folds, etc. that are found in the conventional panels.

If the structural panels 20 are to be connected to an anchor wall, as shown in Fig. 5B, anchor members, such as tie rods 64 are connected from an anchor wall 66 to the panels. The configuration permits the anchoring of the panels without the requirement of wales or piles. Thus, the configuration and strength attributes of applicant's structural panel facilitates the use of the panels with wales or with anchor walls.

Claim Rejections - 35 U.S.C. 103

Claims 1, 33 and 34 were rejected under § 103(a) as being unpatentable over Cole et al. (4,917,543) in view of Okimoto, et al. (JP-63312413-A).

Cole et al. illustrates and describes curved structural walls formed of extruded plastic material that provides a convex outer surface in the shape of a segment of a cylinder. Wale members 30 are applied to the wall. As shown in Figs. 10, 12, and 16, the wales make "point-to-point" contact with the wall structural panels. This is significantly different from applicant's invention. Applicant's invention avoids point-to-point contact and the deterioration caused by such contact, yet provides a strong enough structure that does not require the non-planar configuration of the panels.

Okimoto, et al. describes a panel that is not suitable for extrusion and also has its interlocking members extending beyond the plane of the outer wall. Again, this creates point-to-point contact, particularly with respect to the female connector. Applicant avoids this problem.

Claim 1 distinguishes over the combined references of Cole et al. and Okimoto et al. by including the opposed side wall sections being co-planar with the central wall section and

forming with the inner wall section a substantially flat outer surface, of the locking elements configured not to protrude beyond the substantially flat outer surface of the structural panel, and the strengthening flanges forming a U-shape with the central wall section, providing extra strength to the overall structure.

The Office Action indicates that the choice of whether to use planar sections is a matter of design choice. However, the requirement of stronger, thicker and non-planar shapes to make strong panels suggests otherwise. Applicant's structural panels provide a stronger profile with beneficial results not found in the applied references.

Claim 33 has been amended to include the material of the structural panel being extruded about the strengthening member. This distinguishes over the references.

Claim 34 depends from 33, and should be allowable for the same reasons. Claim 34 also describes the strengthening flanges.

Claims 2-5, 9, 13 and 36 were rejected under § 103(a) as being unpatentable over Cole et al. in view of Okimoto et al., as applied to claims 1 and 33, and further in view of Papetti (5,161,917). The Office Action indicates that Cole et al. and Okimoto et al. both fail to disclose a strengthening member encased in plastic, and Papetti is used to teach plastic coated double twisted metal mesh.

Applicant's claim 2 sets forth the strengthening sheet having been encased in the material by extrusion of the structural panel and shielded by the material from contact with the outside environment. This should distinguish over the applied references. Papetti simply discloses a galvanized and plastic-coated, twisted metal mesh with a hexagonal grid. Papetti discloses the concept of folding his coated metal mesh to form other objects, such as gabion baskets. This

does not approach applicant's concept of an extruded structural panel with a strengthening sheet having been encased in the material by the extrusion process, and with the strengthening sheet being shielded by the extruded material from contact with the outside environment.

Claim 3 adds the feature of the strengthening sheet being U-shaped in cross-section, and being disposed in the U-shape of the structural panel. This provides an additional strengthening feature to the structural panel in that the U-shape provides strength, and the inclusion of the strengthening material within the U-shape adds significantly to the strength of the overall structural panel.

Claim 3 adds the strengthening sheet material comprising metal sheet material in the U-shape configuration.

Claim 4 is cancelled.

Claim 5 identifies the strengthening sheet being selected from the group consisting essentially of steel, galvanized steel, expanded metal, fiberglass and aluminum. While Papetti discloses metal of galvanized steel, Papetti also states that the product, after having been coated, is folded. (Col. 3, lines 1-11, and col. 4, lines 12-16 and lines 34-42.) Thus, it appears that the purpose of Papetti's plastic-coated metal wire does not suggest the use of the wire to strengthen the plastic coated on the wire.

Claim 9 and 13 should be allowable as they depend from a parent claim that should be allowable.

The rejection of claim 36 with claims 2-5, 9 and 13 is not understood since claim 36 depends from claim 33. Claim 36 has now been amended to set forth the U-shaped strengthening member formed in the U-shape within the material of the panel.

Claims 14 and 15 were rejected under § 103(a) as being unpatentable over Cole et al. in view of Okimoto et al. and Papetti, as previously applied, and further in view of Nottingham (U.S. 2002/0054791-A1). Claims 14 and 15 depend from claims 2 and 1, and should be allowable for the same reasons as those claims are allowable. Claim 14 emphasizes that the strengthening member comprises fiberglass, is U-shaped in cross-section and is disposed in the similarly U-shaped portion of the structural panel. This is not disclosed in the applied references. This provides a strength property to the structural panel that enables the panel to have a flat outside surface, recessed connectors at the side edges, and a means by which the panel can be anchored. These features are not disclosed by the applied references.

Claim 16 is rejected under § 103(a) as being unpatentable over Wheeler, Jr. et al. (6,357,969) in view of Cole, et al. (4,917,543). Wheeler, Jr. et al. concerns a method of fabricating a groundwater monitoring system that has edge-to-edge connections, and which is driven into the ground. However, Wheeler, Jr. et al. shows an expanded Z-shape panel with the Z-shape providing resistance to bending or warping of the panel during the process of driving the panel into the earth.

Claim 16 sets forth the outer surface of the structural panel being substantially flat, with the outer surfaces of the adjacent panels and the wall structure being arranged in the same plane, and the locking elements not extending beyond the plane of the outer surfaces. This is not disclosed in the combined references.

Claim 27 was rejected under § 103(a) as being unpatentable over Cole et al. in view of Nottingham. Cole et al. and Nottingham do not describe the features of amended claim 27, of the structural panels formed of a resin material, and a strengthening sheet having been encased

within the resin material by extrusion of the resin material about the strengthening sheet of each panel so that the strengthening sheet provides additional strength to the resin material so that the structural panels can be driven into the earth and the strengthening sheet is shielded from contact with the atmosphere by the resin material.

Claims 28 and 29 were rejected under § 103(a) as being unpatentable over Cole et al. in view of Nottingham, and further in view of Papetti and Tanaka et al. (5,364,682). Applicant acknowledges that Papetti discloses plastic coated double twisted mesh material which is perforated. However, this is not the same as applicant's barrier wall that has a series of panels formed of resin material, with a strengthening sheet having been encased within the resin material by extrusion of the resin material about the strengthening sheet so that the strengthening sheet provides additional strength to the resin material and the structural panels can be driven into the earth with the strengthening sheet being shielded from contact with the atmosphere by the resin material.

Claims 30-32 were rejected under § 103(a) as being unpatentable over the previously combined references, taken further in view of Golcheh (6,675,547). Golcheh is used to disclose the rib 24. However, the combination of references does not make obvious the features of the parent claims, as set forth above.


Conclusion

Applicant submits that the claimed invention provides a structure and process that is not taught or made obvious by the applied references. The applicant's structural wall panels are strong, yet have a flat outside wall. The outer material being extruded about the strengthening material enhances the strength of the panels. The outer material shields the strengthening

material from the atmosphere. The flat outside wall reduces the point contact of a wale or any other structure to a broader contact, thereby reducing the deterioration of the panels. In addition, the panels provide the option of not utilizing wales but anchoring the panels from the inside with connection made to the strengthening flanges of the panels.

Applicant submits that the claims of the application should now be in condition for allowance and appropriate action is courteously solicited.

Respectfully submitted,


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